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Patent No. 7,223,322  
 Request for Cert. of Correction dated September 17, 2007  
 Attorney Docket No. 2398-031312



# IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent No. : 7,223,322 Confirmation No. 7119

Inventor : Mark A. Bernick

Issued : May 29, 2007

Title : Moving Magnetic/Cathode Arrangement and Method

Examiner : Rodney G. McDonald

Customer No. : 28289

## REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT

Commissioner for Patents  
 P.O. Box 1450  
 Alexandria, VA 22313-1450

ATTENTION: Decision and Certificate of Correction  
 Branch of the Patent Issue Division

**Certificate**  
 SEP 21 2007  
**of Correction**

Sir:

In accordance with 35 U.S.C. §§254 and 255, we attach hereto Form PTO/SB/44 and a copy of proof of errors and request that a Certificate of Correction be issued in the above-identified patent. The following errors appear in the patent as printed:

- (1) Column 6, line 49, Claim 2, "closed loop magnetic tunnel" should read -- closed magnetic tunnel --  
 (See the Amendment dated 10/11/2005, page 2, Claim 2, lines 2-3.)
- (2) Column 6, lines 60-61, Claim 5, "the loop magnet arrangement" should read -- the magnet arrangement --  
 (See the Amendment dated 10/11/2005, page 3, Claim 6, line 2.)
- (3) Column 6, line 63, Claim 7, "concentric motion, eccentric motion, and linear motion" should read -- concentric motion and eccentric motion --  
 (See the Amendment dated 04/20/2006, page 3, Claim 7, line 2.)
- (4) Column 7, line 13, Claim 11, "magnet is extends" should read -- magnet extends --  
 (See the Amendment After Final and RCE dated 01/10/2007, page 7, Claim 21, line 2. Claim 21 issued as Claim 11.)
- (5) Column 7, line 21, Claim 12, "having a outer edge" should read -- having an outer edge --  
 (See the Amendment After Final and RCE dated 01/10/2007, page 6, line 3, Claim 13. Claim 13 issued as Claim 12.)
- (6) Column 7, line 23, Claim 12, "a closed loop magnet" should read -- a closed magnet --  
 (See the Amendment dated 10/11/2005, page 4, Claim 13, line 2.)

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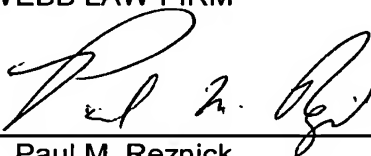
SEP 21 2007

- (7) Column 7, line 28, Claim 12, "having a apex, wherein the closed loop magnet" should read -- having an apex, wherein the closed magnet --  
(See the Amendment dated 10/11/2005, page 4, Claim 13, lines 4-5. Claim 13 issued as Claim 12.)
- (8) Column 8, line 25, Claim 16, "top portion, contoured top portion" should read -- top portion, the contoured top portion --  
(See the Amendment After Final and RCE dated 01/10/2007, page 6, Claim 15, lines 8-9 Claim 15 issued as Claim 16.)
- (9) Column 8, line 32, Claim 16, "more rational" should read -- more rotational --  
(See the Amendment After Final and RCE dated 01/10/2007, page 7, line 4, Claim 15. Claim 15 issued as Claim 16.)
- 10) Column 8, line 43, Claim 18, "closed loop magnet" should read -- closed magnet --  
(See the Amendment After Final and RCE dated 01/10/2007, page 7, Claim 18, line 2.)

Error number (4) is an obvious typographical error made by Applicant. A check for \$100.00 is attached to cover the fee for correction of Applicant's mistakes. The remaining errors are printing errors.

Respectfully submitted,  
THE WEBB LAW FIRM

By



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**UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION**

Page 1 of 2

PATENT NO. : 7,223,322  
APPLICATION NO. : 10/624,921  
ISSUE DATE : May 29, 2007  
INVENTOR : Bernick

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

- (1) Column 6, line 49, Claim 2, "closed loop magnetic tunnel" should read -- closed magnetic tunnel --
- (2) Column 6, lines 60-61, Claim 5, "the loop magnet arrangement" should read -- the magnet arrangement --
- (3) Column 6, line 63, Claim 7, "concentric motion, eccentric motion, and linear motion" should read -- concentric motion and eccentric motion --
- (4) Column 7, line 13, Claim 11, "magnet is extends" should read -- magnet extends --
- (5) Column 7, line 21, Claim 12, "having a outer edge" should read -- having an outer edge --
- (6) Column 7, line 23, Claim 12, "a closed loop magnet" should read -- a closed magnet --

MAILING ADDRESS OF SENDER: The Webb Law Firm  
700 Koppers Building  
436 Seventh Avenue  
Pittsburgh, PA 15219

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-2450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

*If you need assistance in completing the form, call 1-800-PTO-9199 and select Option 2.*

SEP 21 2007

**UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION**

Page 2 of 2

PATENT NO. : 7,223,322  
APPLICATION NO. : 10/624,921  
ISSUE DATE : May 29, 2007  
INVENTOR : Bernick

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

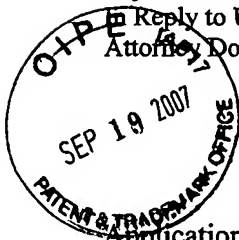
- (7) Column 7, line 28, Claim 12, "having a apex, wherein the closed loop magnet" should read -- having an apex, wherein the closed magnet --
- (8) Column 8, line 25, Claim 16, "top portion, contoured top portion" should read -- top portion, the contoured top portion --
- (9) Column 8, line 32, Claim 16, "more rational" should read -- more rotational --
- 10) Column 8, line 43, Claim 18, "closed loop magnet" should read -- closed magnet --

MAILING ADDRESS OF SENDER: The Webb Law Firm  
700 Koppers Building  
436 Seventh Avenue  
Pittsburgh, PA 15219

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-2450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

*If you need assistance in completing the form, call 1-800-PTO-9199 and select Option 2.*

Application No.: 10/624,921  
Paper Dated: October 11, 2005  
In Reply to USPTO Correspondence of May 9, 2005  
Attorney Docket No. 2398-031312



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 10/624,921 Confirmation No.: 7119  
Applicant : Mark A. Bernick  
Filed : July 22, 2003  
Title : **MOVING MAGNETIC/CATHODE ARRANGEMENT AND METHOD**  
Art Unit : 1753  
Examiner : Rodney Glenn McDonald  
Customer No. : 28289

MAIL STOP AMENDMENT  
Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

AMENDMENT

Sir:

In response to the Office Action of May 9, 2005, please amend the above-identified application as follows:

**Amendments to the Claims** are reflected in the listing of claims which begins on page 2 of this paper.

**Remarks** begin on page 6 of this paper.

A Two-month Petition for Extension of Time is submitted herewith. Due to the ninth of the month falling on Sunday and the next day being a Federally recognized holiday, this response is timely in the context of a two-month extension.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on October 11, 2005.

Deborah L. Hartmann  
(Name of Person Mailing Paper)

*Deborah L. Hartmann* 10/11/2005  
Signature Date

SEP 21 2007

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**

1. (Currently Amended): A magnetron sputtering electrode for use with a magnetron sputtering device, the magnetron sputtering electrode comprising:

a cathode body;

a drive unit coupled to the cathode body;

a target received by the cathode body; and

a closed loop magnet arrangement received within a magnet receiving chamber and coupled to the drive unit, the closed loop magnet arrangement comprised of a plurality of magnets adapted for motion relative to the target by the drive unit, wherein at least one of the plurality of magnets is a profiled magnet having a contoured top portion; and

a support plate coupled to the drive unit, wherein the support plate includes one or more spacer blocks situated on the support plate, wherein the spacer blocks are constructed of non-magnetic material, and wherein the plurality of magnets are arranged on the support plate such that a portion of the contoured top portion of each of the plurality of magnets is positioned beneath an upper surface of the spacer blocks.

2. (Currently Amended): The magnetron sputtering electrode as claimed in claim 1, wherein the plurality of magnets cooperate to generate magnet flux lines which form a closed loop magnetic tunnel adjacent to a front sputtering surface of the target.

3. (Original): The magnetron sputtering electrode as claimed in claim 1, wherein the target is one of a linear target and a circular target.

4. (Cancelled)

5. (Currently Amended): The magnetron sputtering electrode as claimed in claim 4~~1~~, wherein the drive unit is comprised of at least one drive shaft and at least one motor, wherein the at least one drive shaft is coupled to the support plate and the at least one motor is coupled to the at least one drive shaft.

6. (Currently Amended): The magnetron sputtering electrode as claimed in claim 5, wherein activation of the at least one motor causes the ~~loop~~ magnet arrangement to rotate about an axis.

7. (Original) The magnetron sputtering electrode as claimed in claim 1, wherein the motion is one of concentric motion, eccentric motion, and linear motion.

8. (Original) The magnetron sputtering electrode as claimed in claim 7, wherein the motion further comprises two or more degrees of freedom of movement.

9. (Currently Amended): The magnetron sputtering electrode as claimed in claim 4~~1~~, wherein the support plate includes channels for accommodating the plurality of profiled magnets.

10. (Cancelled)

11. (Original): The magnetron sputtering electrode as claimed in claim 1, wherein the form of the profiled magnet is one of a rectilinear form and a cylindrical form.

12. (Original): The magnetron sputtering electrode as claim in claimed 1, wherein the contoured top portion is one of an angled shape, sloped shape, conical shape, parabolic shape, convex shape, and a concave shape.

12 13. (Currently Amended): A magnetron sputtering electrode for use with a magnetron sputtering device, the magnetron sputtering electrode comprising:

a cathode body;

a drive unit coupled to the cathode body, wherein the drive unit is comprised of a drive shaft and a motor;

2 a target received by the cathode body; and  
a closed loop magnet arrangement comprised of an inner assembly and an outer assembly, the inner assembly and the outer assembly comprised of a plurality of profiled magnet segments, wherein each of the profiled magnet segments includes a contoured top portion, wherein the closed loop magnet arrangement is situated beneath the target and is coupled to the drive shaft, wherein the drive shaft is adapted to rotate the closed loop magnet arrangement in relation to the target; and  
5 a support plate coupled to the drive unit, wherein the support plate includes a plurality of spacer blocks situated on the support plate, wherein the spacer blocks are constructed of non-magnetic material, and wherein each of the profiled magnet segments is arranged on the support plate such that a portion of the contoured top portion of each of the profiled magnet segments is positioned beneath an upper surface of the plurality of spacer blocks.

10

*Having an apex  
was inserted in the Amendment  
of  
Jan 10  
2007*

14. (Original): The magnetron sputtering electrode as claimed in claim 13, wherein the contoured top portion comprises an apex that is flat, wherein the apex is up to half the thickness of the magnet segment.

15. (Currently Amended): A method of improving target utilization in sputtering applications, the method comprising:

- providing a substrate;
- providing a cathode body;
- providing a target received by the cathode body;

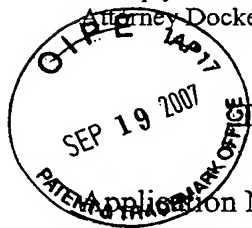
providing a closed loop magnet arrangement within a magnet receiving chamber, the closed loop magnet arrangement comprised of a plurality of magnets, wherein at least one of the plurality of magnets is a profiled magnet having a contoured top portion, wherein the contoured top portion includes an apex that is flat, wherein the apex is up to half the thickness of the magnet segment;

moving the closed loop magnet arrangement in relation to the target, wherein the motion further comprises two or more degrees of freedom of movement, wherein the two degrees of freedom of movement are selected from concentric motion, eccentric motion, and linear motion;

- obtaining target material from the target; and
- depositing the target material on the substrate.



Application No.: 10/624,921  
Paper Dated: April 20, 2006  
In Reply to USPTO Correspondence of December 20, 2005  
Attorney Docket No. 2398-031312



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 10/624,921 Confirmation No.: 7119  
Applicant : Mark A. Bernick  
Filed : July 22, 2003  
Title : **MOVING MAGNETIC/CATHODE ARRANGEMENT AND METHOD**  
Art Unit : 1753  
Examiner : Rodney Glenn McDonald  
Customer No. : 28289

MAIL STOP AMENDMENT  
Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

**AMENDMENT**

Sir:

In response to the Office Action of December 20, 2005, please amend the above-identified application as follows:

**Amendments to the Claims** are reflected in the listing of claims which begins on page 2 of this paper.

**Remarks** begin on page 6 of this paper.

A one-month Petition for Extension of Time is submitted herewith.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on April 20, 2006.

Helen Gerace

(Name of Person Mailing Paper)

*Helen Gerace*  
Signature

04/20/2006

Date

5. (Previously Presented): The magnetron sputtering electrode as claimed in claim 1, wherein the drive unit is comprised of at least one drive shaft and at least one motor, wherein the at least one drive shaft is coupled to the support plate and the at least one motor is coupled to the at least one drive shaft.

6. (Previously Presented): The magnetron sputtering electrode as claimed in claim 5, wherein activation of the at least one motor causes the magnet arrangement to rotate about an axis.

7. (Currently Amended) The magnetron sputtering electrode as claimed in claim 1, wherein the motion is one of concentric motion; and eccentric motion; ~~and linear motion.~~

8. (Cancelled)

9. (Previously Presented): The magnetron sputtering electrode as claimed in claim 1, wherein the support plate includes channels for accommodating the plurality of profiled magnets.

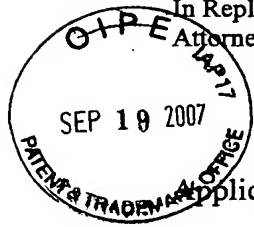
10. (Cancelled)

11. (Original): The magnetron sputtering electrode as claimed in claim 1, wherein the form of the profiled magnet is one of a rectilinear form and a cylindrical form.

12. (Original): The magnetron sputtering electrode as claim in claimed 1, wherein the contoured top portion is one of an angled shape, sloped shape, conical shape, parabolic shape, convex shape, and a concave shape.

13. (Currently Amended): A magnetron sputtering electrode for use with a magnetron sputtering device, the magnetron sputtering electrode comprising:  
a cathode body;

Response Under 37 CF. 116  
Expedited Procedure  
Examining Group 1700  
Application No.: 10/624,921  
Paper Dated: January 10, 2007  
In Reply to USPTO Correspondence of July 10, 2006  
Attorney Docket No. 2398-031312



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 10/624,921 Confirmation No.: 7119  
Applicant : Mark A. Bernick Art Unit: 1753  
Filed : July 22, 2003  
Title : **MOVING MAGNETIC/CATHODE ARRANGEMENT AND METHOD**  
Examiner : Rodney Glenn McDonald  
Customer No. : 28289

MAIL STOP RCE  
Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

**AMENDMENT AFTER FINAL AND RCE**

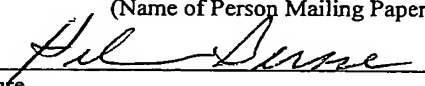
Sir:

In response to the Final Office Action of July 10, 2006, Applicant hereby submits the following amendments, remarks, Declaration, Request for Continued Examination (RCE) Transmittal and a three-month Petition for Extension of Time:

**Amendments to the Specification** begins on page 2 of this paper.

**Amendments to the Claims** are reflected in the listing of claims which begins on page 4 of this paper.

**Remarks** begin on page 9 of this paper.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on January 10, 2007.	
Helen Gerace (Name of Person Mailing Paper)	
	01/10/2007
Signature	Date

a rotary drive unit coupled to the cathode body, wherein the drive unit is comprised of a drive shaft and a motor;

3 a target having an outer edge received by the cathode body;

7 a closed magnet arrangement comprised of an inner assembly and an outer assembly, the inner assembly and the outer assembly comprised of a plurality of profiled magnet segments, wherein each of the profiled magnet segments includes a contoured top portion having an apex, wherein the closed magnet arrangement is situated beneath the target and is coupled to the drive shaft, wherein at least one of the profiled magnet segments has an apex positioned adjacent to the outer edge of the target, and wherein the drive shaft is adapted to rotate the closed magnet arrangement in relation to the target; and

a support plate coupled to the rotary drive unit, wherein the support plate includes a plurality of spacer blocks situated on the support plate, wherein the spacer blocks are constructed of non-magnetic material, and wherein each of the profiled magnet segments is arranged on the support plate such that a portion of the contoured top portion of each of the profiled magnet segments is positioned beneath an upper surface of the plurality of spacer blocks, and wherein the rotary drive unit rotates the magnet arrangement whereby the motion further comprises two or more rotational degrees of freedom of movement about an axis.

13. 14. (Currently Amended): The magnetron sputtering electrode as claimed in claim 12, wherein the apex of the contoured top portion ~~comprises an apex that is flat,~~ wherein the apex is up to half the thickness of the magnet segment.

16. 18. (Currently Amended): A method of improving target utilization in sputtering applications, the method comprising:

providing a substrate;

providing a cathode body;

5 providing a target having an outer edge received by the cathode body;

8 providing a closed magnet arrangement within a magnet receiving chamber, the closed magnet arrangement comprised of a plurality of magnets, wherein at least one of the plurality of magnets is a profiled magnet having a contoured top portion, ~~wherein the~~ contoured top portion includes an apex that is flat, wherein the apex is up to half the thickness

Expedited Procedure

Examining Group 1700

Application No.: 10/624,921

Paper Dated: January 10, 2007

In Reply to USPTO Correspondence of July 10, 2006

Attorney Docket No. 2398-031312

of the magnet segment and wherein the apex is positioned adjacent to the outer edge of the target;

4 moving the closed magnet arrangement in relation to the target, wherein the motion further comprises two or more rotational degrees of freedom of movement about an axis, wherein the two degrees of freedom of movement are selected from concentric motion and eccentric motion;

obtaining target material from the target; and

depositing the target material on the substrate.

16. (Cancelled)

17. (Previously Presented): The method of claim <sup>16</sup>15, wherein the contoured top portion is adapted to direct magnetic flux lines to a front sputtering surface of the target.

18. (Previously Presented): The method of claim <sup>16</sup>15, further comprising a motor, wherein the motor rotates the closed magnet arrangement.

19. (Cancelled)

<sup>10</sup>20. (New): The magnetron sputtering electrode as claimed in claim 1, wherein a portion of the contoured top portion of the profiled magnet is positioned at the outer edge of the target.

<sup>11</sup>21. (New): The magnetron sputtering electrode as claimed in claim 1, wherein a portion of the contoured top portion of the profiled magnet extends beyond the outer edge of the target.

<sup>14</sup>22. (New): The magnetron sputtering electrode as claimed in claim <sup>12</sup>13, wherein a portion of the contoured top portion of the profiled magnet segment is positioned at the outer edge of the target.